Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

**Extracting g tensor values from experimental data with Markov Chain Monte Carlo methods** ANAGHA KULKARNI, Department of Electrical and Computer Engineering,University of Delaware, WEIWEN LIU, Department of Material Sciences and Engineering, University of Delaware, RYAN ZURAKOWSKI, Department of Biomedical Engineering, University of Delaware, MATTHEW DOTY, Department of Material Sciences and Engineering, University of Delaware — Quantum Dot Molecules(QDMs) have emerged as a new platform for optoelectronic and spintronic devices.QDMs consist of multiple Quantum Dots (QDs) arranged in close proximity such that interactions between them can tailor their optical and spin properties.These properties can be tuned during growth and in-situ by applying electric fields that vary the coupling between QDs,which controls the formation of delocalized molecular-like states.Engineering the formation of molecular states in QDMS can be used to achieve new functionalities unavailable with individual QDs. Using molecular engineering approaches to tailor QDMs require precise knowledge of parameters such as binding energies of charge complexes,magnitude of many body interactions or components of the g tensor.Precise values of these parameters are difficult to extract from either experimental measurements or theoretical calculations.We develop and demonstrate a Markov Chain Monte Carlo method for extracting elements of the g tensor for a single hole confined in a QDM from photoluminescence data obtained as a function of electric and magnetic fields.This method can be applied to extract precise quantitative values of other physical parameters from sparse experimental data on a variety of systems.

Anagha Kulkarni
Univ of Delaware

Date submitted: 06 Nov 2015 Electronic form version 1.4